

North Sapphire Elk Research Project

Progress Report - Fall 2014

Project Background

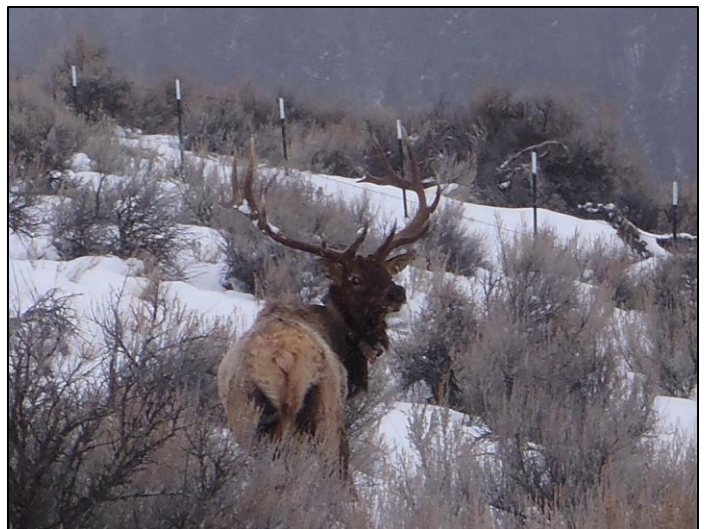
Montana Fish, Wildlife and Parks, in collaboration with the MPG Ranch, Ecosystem Research Group, and multiple project partners, is conducting a two-year elk research project in the North Sapphire Mountains. About one thousand elk inhabit the Northern Sapphire Mountains and Bitterroot Valley south of Missoula. These elk provide hunting and wildlife viewing opportunities to the residents of the Bitterroot and Missoula Valleys, to Montanans from beyond the immediate region, and to out-of-state visitors. This area includes Hunting District (HD) 204 and the north portions of HD 261 and 240. These elk herds typically move from



higher elevation summer ranges on public and corporate timber lands to lower elevation winter ranges, most of which are on private land. In recent years, this migratory behavior may have changed and elk may be spending increasing amounts of time on privately owned portions of the winter range. This extended valley habitation may be undesirable to landowners trying to manage forage for domestic livestock, and to hunters searching for elk on public lands. The goal of the project is to collect baseline information regarding public and landowner opinions towards elk management and baseline information regarding elk movements and habitat in the Northern Sapphire Mountains area. This information will be used to identify and develop effective responses to management challenges within the hunter and private landowner communities of the Northern Sapphire Range. This report summarizes the work conducted to date, and preliminary findings.

Elk Monitoring and Survival

We deployed GPS collars on 65 elk (20 bulls, 45 cows) during February 2014. We programmed collars to collect a location every two hours for a two-year period. The release mechanism on two collars malfunctioned and released early, one on March 26th and the second on May 17th. One bull died from wounding loss on the opening day of the 2014 archery season. All other elk are alive with functional collars and continue to be monitored.



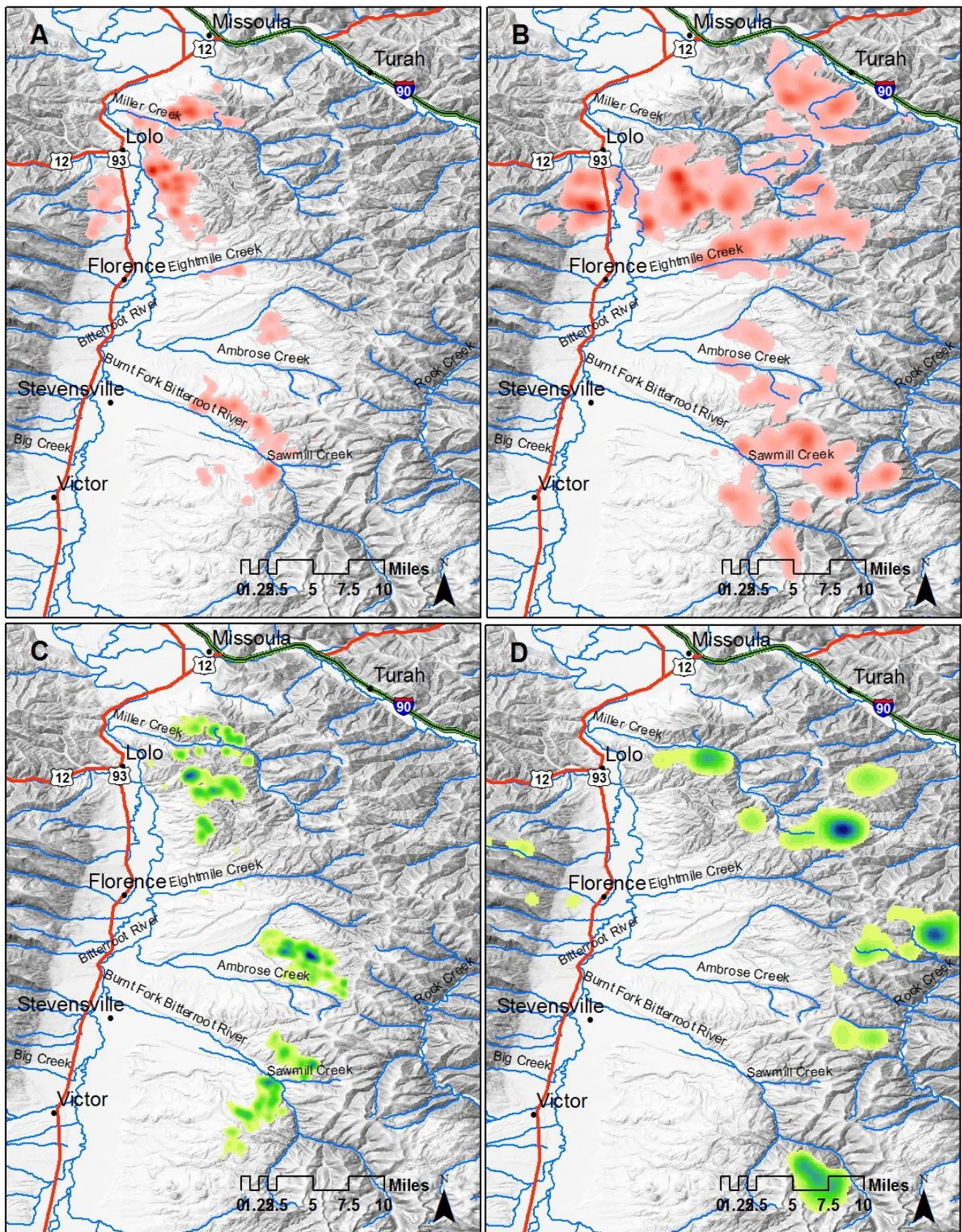


Figure 1. The distribution of GPS collared cow (red) and bull (green) elk during the winter (Panel A, C) and summer (Panel B, D).

Elk Movements

During spring and summer, most elk moved to higher elevation summer ranges (Figure 1). Cow elk in the Miller Creek area and Burnt Fork/Sawmill Creek area utilized traditional, high elevation summer ranges and displayed migratory movement behaviors. A component of the cow elk herd located around Davis Creek and McClain Creek did not display migratory movement behavior, and instead regularly utilized portions of the winter range throughout the summer. Location data show these non-migratory elk make regular nighttime trips to irrigated fields, and then retreat to the timber during the day.

Although cow elk displayed a mixture of migratory and non-migratory behaviors, each collared bull elk displayed typical migratory movements with the exception of one young bull. A 2.5-year old bull captured in the Davis Creek area has been on the move since early spring. He travelled south to the Ambrose – Threemile Area, then crossed HY 93 on May 20th and has been exploring the HD 240 area from Lolo Peak to Sweeney Creek. This animal did not establish a defined winter or summer range. The other collared bulls moved to traditional, high elevation summer ranges.

Cow elk primarily used privately owned lands during late winter (March - April) and early summer (May – June), and used both public and privately owned lands during late summer (July – August, Figure 2). During late winter, cow elk were located on public lands 8% of the time. Individual cow elk spent 0 – 35% of their time on public land during late winter. During early summer, cow elk were located on public lands 32% of the time. Individual cow elk spent 0 – 98% of their time on public land during early summer. During late summer, cow elk were located on public lands 45% of the time. Individual cow elk spent 2 – 99% of their time on public land during late summer. Some of the private land use during late summer occurred on corporate timberlands adjacent to Forest Service lands.

Bull elk primarily used privately owned lands during late winter and primarily used public lands during early and late summer (Figure 2). During late winter, bulls were located on public lands 28% of the time. Individual bull elk spent 0 – 51% of their time on public land during late winter. During early summer, bulls were located on public lands 60% of the time. Individual bull elk spent 13 – 98% of their time on public land during early summer. During late summer, bull elk were located on public lands 83% of the time. Individual bull elk spent 16 – 100% of their time on public land during late summer. Much of the private land use during late summer occurred on corporate timberlands adjacent to Forest Service lands.

There have been three documented movements across HWY 93. In addition to the younger bull previously described that crossed the Highway May 20, one cow elk from the McClain Creek

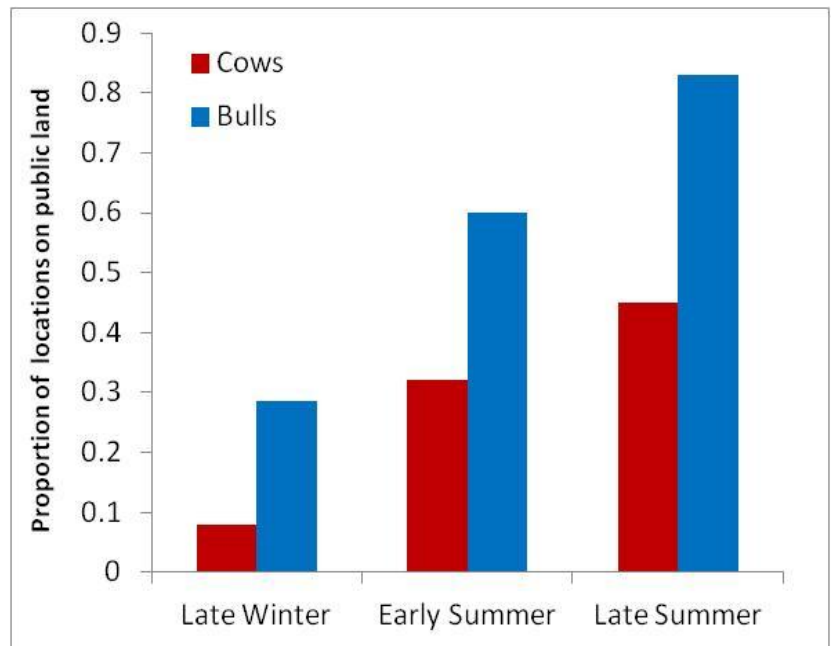


Figure 2. The proportion of locations from collared cow elk (red) and bull elk (blue) that occurred on public lands during the late winter (March – April), early summer (May – June), and late summer (July – August).

area crossed HY 93 two times. This elk crossed on July 7th and spent two days near the Bitterroot River, then crossed back to the west side of the highway on July 9th. All three of the highways crossings occurred during the night, and each of the crossings occurred at a different location.

Elk Habitat and Vegetation Monitoring

During summer 2014, we initiated fieldwork to evaluate elk forage availability and quality across the study area. The goal of the vegetation sampling is to develop a spatially explicit landscape level estimate of dietary digestible energy available to elk in mid to late summer. During this period, forage quality is important to elk because of its influence on the probability of pregnancy and overwinter survival. To evaluate forage quality, we have three objectives. The first objective is to evaluate elk diet during the spring, early summer, late summer, and winter. Composite elk pellet samples were collected for early summer diet analysis during June 4 – June 19. The Washington State Wildlife Habitat Nutrition Laboratory is conducting the diet analysis and we expect results during spring 2015. The second objective is to evaluate the availability and abundance of forage plants across the study area. Sampling locations were stratified across elevation, aspect and six major cover classes (Recently Burned Forest, Forested Areas, Deciduous Forest, Shrubland, Grassland, Wetland). We collected data at 261 locations mid-July to the end of August. At each site we measured species composition and cover at five plots, and biomass of grasses and forbs at three plots. We recorded plant phenology at each sampling location, and repeatedly sampled fixed phenology plots throughout the summer to estimate seasonal changes in forage availability. The third objective is to estimate the digestibility of elk forage plants. We



collected forage plants at each phenological stage throughout the study area. Forage plants will be evaluated in the laboratory to estimate digestible energy. A second field season of vegetation monitoring is planned for summer 2015.

Additionally, to better understand elk nutritional resources, we are investigating the relationship between elk fecal nutrient levels, forage quality, and remotely sensed vegetation indices. We collected elk pellets and plant samples biweekly throughout the growing season and will compare fecal nutrient levels, plant nutrient levels, and remotely sensed vegetation indices. We collected pellet samples from resident and migratory elk, and will evaluate differences between resident and migratory elk nutrient exposure and consumption. Our first objective is to determine if remote sensing data may be used to track increases in elk nutrition during the green-up period as well as decreases in nutrition during the fall. Our second objective is to compare fecal nutrient levels between resident and migratory elk in order to better understand the consequences of migratory strategies on elk nutrition and condition.

Landowner and Hunter Survey Results

The purpose of the landowner and elk hunter surveys was to provide baseline information about the perceptions of both landowners and hunters regarding: (1) current elk population management objectives; (2) current elk hunting regulations; and, (3) specific issues related to elk hunting access. In spring 2014, we mailed surveys to all landowners with 160 or more acres of property within the study area. A total of 78 surveys were mailed, 71 surveys were received, and 33 (47%) landowners responded to the survey. Additionally, we mailed hunter surveys to a random sample of 5,000 resident elk license holders from the 2013 hunting season who reside in Missoula, Ravalli, and Granite Counties. A total of 4,442 hunters received the survey and a total of 1,829 (41%) hunters responded to the survey. Below is a summary of key findings, and a complete report summarizing the surveys will be available in late Fall 2014.

In the landowner responses, 69% of landowners responded that their primary motivation for owning property in HD 204 was for wildlife conservation, recreation, and preserving open spaces. Twenty-two (22%) percent primarily own land for livestock production and 9% for agricultural production. Sixty-seven (67%) percent of landowners responded that they allow elk hunting on their property. Of the various management systems landowners use to manage hunting on their lands, 55% responded they manage cow elk hunting in a non-block management program allowing primarily friends and family to hunt, and 85% responded they manage bull elk hunting in a non-block management program allowing primarily friends and family to hunt. Forty-six (46%) percent of landowners responded they see less elk on their property during the hunting season than in the past, 39% responded they see the same number of elk on their property as in the past, and 15% responded they see less elk on their property than in the past.

In the hunter survey responses, 85% of those who hunt in HD 204 responded that they primarily hunt on public lands. Seventy-three (73%) percent of hunter respondents perceive there are less overall numbers of elk as compared to the past. Hunters identify wolves and elk movement to private lands with no hunter access as the primary reason for the decrease in the number of elk they encounter.

Survey Question: Managing for higher numbers of mature bull elk may require implementing more restrictive elk hunting regulations. Given only ONE CHOICE, which of the following would be most favorable to you in HD 204?

Hunter responses:

57.7% The opportunity to hunt bull elk every year with a *lower probability* of harvesting a mature bull elk

42.3% The opportunity to hunt bull elk once every several years with a *higher probability* of harvesting a mature bull elk

Landowner responses:

46.4% The opportunity to hunt bull elk every year with a *lower probability* of harvesting a mature bull elk

53.6% The opportunity to hunt bull elk once every several years with a *higher probability* of harvesting a mature bull elk



Acknowledgements

We thank the landowners that have allowed access for fieldwork and provided logistical support, and the organizations and individuals that have provided financial support for this project : Ecosystem Research Group, Montana Department of Transportation, Montana Department of Fish, Wildlife and Parks, Montana's Outdoor Legacy Foundation, MPG Ranch, Ravalli County Fish and Wildlife Association, Rocky Mountain Elk Foundation, Roseburg Forest Product Company, Burnt Fork Ranch, Missoula Community Foundation, First Security Bank of Missoula and Sun Mountain Lumber. Additional funding was provided by revenues from the sale of Montana hunting and fishing licenses and matching Federal Aid in Wildlife Restoration grants to Montana Fish, Wildlife and Parks.